PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

REC'D 0 4 NOV 2005

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 17606.7-D2646-54-ne	FOR FURTHER ACTION	See Form PCT/PEA/416

International application No. PCT/EP2004/008574	International filing date (day/month/year) 30.07.2004	Priority date (day/month/year) 31.07.2003

International Patent Classification (IPC) or national classification and IPC
H04L29/06, H04W31/04, H04Q7/38

Applicant
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1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *sent to the applicant and to the International Bureau)* a total of 5 sheets, as follows:

       ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

       ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I   Basis of the opinion

   ☐ Box No. II   Priority

   ☐ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV   Lack of unity of invention

   ☒ Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI   Certain documents cited

   ☐ Box No. VII   Certain defects in the international application

   ☐ Box No. VIII   Certain observations on the international application

Date of submission of the demand 18.02.2005	Date of completion of this report 03.11.2005
Name and mailing address of the International preliminary examining authority: European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Figiel, B Telephone No. +49 30 25901-473

Box No. I   Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

   ☐ international search (under Rules 12.3 and 23.1(b))
   ☐ publication of the international application (under Rule 12.4)
   ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   Description, Pages

   2-9   as originally filed

   1, 1a   received on 27.04.2005 with letter of 26.04.2005

   Claims, Numbers

   1-11   received on 27.04.2005 with letter of 26.04.2005

   Drawings, Sheets

   1/2, 2/2   as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   ☐ the description, pages
   ☐ the claims, Nos.
   ☐ the drawings, sheets/figs
   ☐ the sequence listing *(specify)*:
   ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   ☐ the description, pages
   ☐ the claims, Nos.
   ☐ the drawings, sheets/figs
   ☐ the sequence listing *(specify)*:
   ☐ any table(s) related to sequence listing *(specify)*:

   *   If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-11
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-11
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-11
	No:	Claims	

2. Citations and explanations (Rule 70.7):

   see separate sheet

Reasoned statement under Rule 43bis.1(a)(i)

1. It is considered that independent **claims 1** (method) **and 9** (system) relate to **new and inventive subject-matter (Articles 33(2) and (3) PCT)**, since the prior art does not disclose or suggest the specifically claimed transparent access authentication of subscribers.

1.1 The following document

   D1: "Access security for IP-based services (Release 5)" 3GPP TS 33.203 V5.6.0, June 2003 (2003-06), pages 1-27,34, XP002264085 (acknowledged in the description),

   is regarded as being the closest prior art and discloses a method for access authentication of subscribers (Authentication of an IM-subscriber; paragraph 6.1.1) connected to an authenticating network domain by a GPRS core network or an UMTS network (PS-Domain in figure 1; also figure 3), wherein the method using data which are assembled by a network layer during establishment of a PDP context in GPRS networks (IP address established during establishment of a primary PDP context is *used* for all further communication; this feature is disclosed implicit in document D1).

1.2 The problem with this prior art is that no authentication on application layer is foreseen in GPRS standard. Thus there is the need to provide a transparent access authentication of subscribers without requiring extensions on network or client side (description, page 1, lines 25-29 and page 2, lines 15-16).

1.3 The application solves this problem by providing the method with following steps:
   -   when a Gateway GPRS Support Node (1) receives a context creation request it queries a registration server (2) to get an IP address assigned for the particular PDP context, and within the context the registration server (2) receives a Mobile Station ISDN Number, MSISDN, and/or an International Mobile Subscriber Identity, IMSI, of the subscriber and stores for each PDP context a pair of IP address and IMSI/MSISDN in a session database (3),

- a proxy server (5) is provided which checks IMSI/MSISDN from a registration server (2) session database (3) and IMSI/MSISDN from a application domain database (4) for match,
- if the IMSI/MSISDN pairs are matching, the proxy server (5) checks a subscribers IP address assigned in the IP network layer for match with the IP address assigned by the registration server (2), and
- the proxy server (5) parses the application layer for IP addresses given in the headers of registration messages and checks for match with the network layer IP address which was already checked for match with the IP address assigned by the registration server (2).

No prior art document anticipates the proposed solution.

1.4 Independent **claim 9** contains the corresponding features as the method of claim 1 expressed respectively in terms of the system. The argumentation of the points 1.1-1.3 applies mutatis mutandis also for this claim.

2. **Claims 2-4 and 6-11** are dependent respectively on claims 1 and 9 and therefore also **meet the requirements of Art.33(2) and Art.33(3) PCT**.

T03018 PCT   ,   1

**Transparent Access Authentication in 2G and 2.5G Mobile
Access Networks**

5   The present invention relates to a method and system for
transparent access authentication in 2G and 2.5G Mobile
Access Networks. This includes communication networks of the
GSM-, GPRS- and UMTS-standard well known to skilled persons.

10   In standardisation of Universal Mobile Telecommunication
System (UMTS Rel.5) comprehensive means are foreseen to
perform authentication on the application layer with no need
to interwork with the underlying radio and transport
networks. The mechanisms are based on the assumption that a
15   specific environment is prepared for deployment of IP
Multimedia Subsystem (IMS) services. It includes the use of
IMS SIM (ISIM) application, which in turn requires
Rel.99UICC's in the connected end devices to handle the
authentication and key agreement (AKA).
20   In case of deployment of IMS and IMS based services in a
network environment which is characterised by the use of SIM
cards, the standardised authentication mechanism will not be
applicable.

25   The Technical Specification 3GPP TS 33.203: "Access Security
for IP-based Services", Release 5, V5.6.0, June 2003, XP-
002264085, discloses a method for transparent access
authentication of subscribers connected to an authenticating
network domain by a GPRS core network or an UMTS network, the
30   method using data which are assembled by a network layer
during establishment of a PDP context in GPRS networks.

AMENDED SHEET

T03018 PCT   1a

It is the object of the invention to provide method and
system for transparent access authentication which allow it
to run authentication transparently to the end device,
without requiring proprietary extensions and functions on
5   network or client side.

This object is achieved by providing a method and system
as described in the independent claims.

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                                              28. 04. 2005   26.04.2005
Claims
                                              ⑧⑨

1. Method for transparent access authentication of

5   subscribers connected to an authenticating network domain

      by a GPRS core network or an UMTS network, wherein the

      method using data which are assembled by a network layer

      during establishment of a PDP context in GPRS networks,

      characterised in

10   that when a Gateway GPRS Support Node (1) receives a

      context creation request it queries a registration server

      (2) to get an IP address assigned for the particular PDP

      context, and within the context the registration server

      (2) receives a Mobile Station ISDN Number, MSISDN, and/or

15   an International Mobile Subscriber Identity, IMSI, of the

      subscriber and stores for each PDP context a pair of IP

      address and IMSI/MSISDN in a session database (3),

      that a proxy server (5) is provided which checks

      IMSI/MSISDN from a registration server (2) session

20   database (3) and IMSI/MSISDN from a application domain

      database (4) for match,

      that if the IMSI/MSISDN pairs are matching, the proxy

      server (5) checks a subscribers IP address assigned in

      the IP network layer for match with the IP address

25   assigned by the registration server (2), and

      that the proxy server (5) parses the application layer

      for IP addresses given in the headers of registration

      messages and checks for match with the network layer IP

      address which was already checked for match with the IP

30   address assigned by the radius server (2).

2. Method according to claim 1, comprising the step that

   during PDP context establishment a Serving GPRS Support

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Node (SGSN) is authenticating the subscriber using the
A3/A8 algorithm based on an end devices SIM card.

3. Method according to any preceding claim, comprising the
 5   step that in all subsequent messages arriving at the
        proxy server (5), it checks for match of IP address in
        the IP packet overhead field for source address with that
        in the application layer protocol header fields and
        verifies the matching pairs against the IP address
10   assigned by the Radius server (2).

4. Method according to any preceding claim, that a routing   ;
        module (7) is provided which is a standard entry point
        for all messages and decides by evaluation of Private ID,
15   PrivID, which network node will handle the message.

5. System of units in a mobile telecommunication network,
        characterised that at least a first authentication unit
        (2) is connected via a data line to a second unit (5; 6)
20   which assembles data according to the method of claim 1.

6. System according to claim 5, wherein the first unit
        comprises a registration server (2).

25 7. System according to claim 5 or 6, wherein the first unit
        (2) is connected to a session database (3).

8. System according to any of claims 5 to 7, wherein the
        second unit comprises a proxy server (5).
30

9. System according to any of claims 5 to 8, wherein the
        second unit comprises a Proxy Call State Control Function
        (6).

10. System according to any of claims 5 to 9, wherein the
    second unit (5; 6) is connected to a subscriber database
    (4).

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11. System according to any of claims 5 to 10, wherein a
    routing module (7) is provided which decides by
    evaluation of Private ID, PivID, which network node will
    handle the message.

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